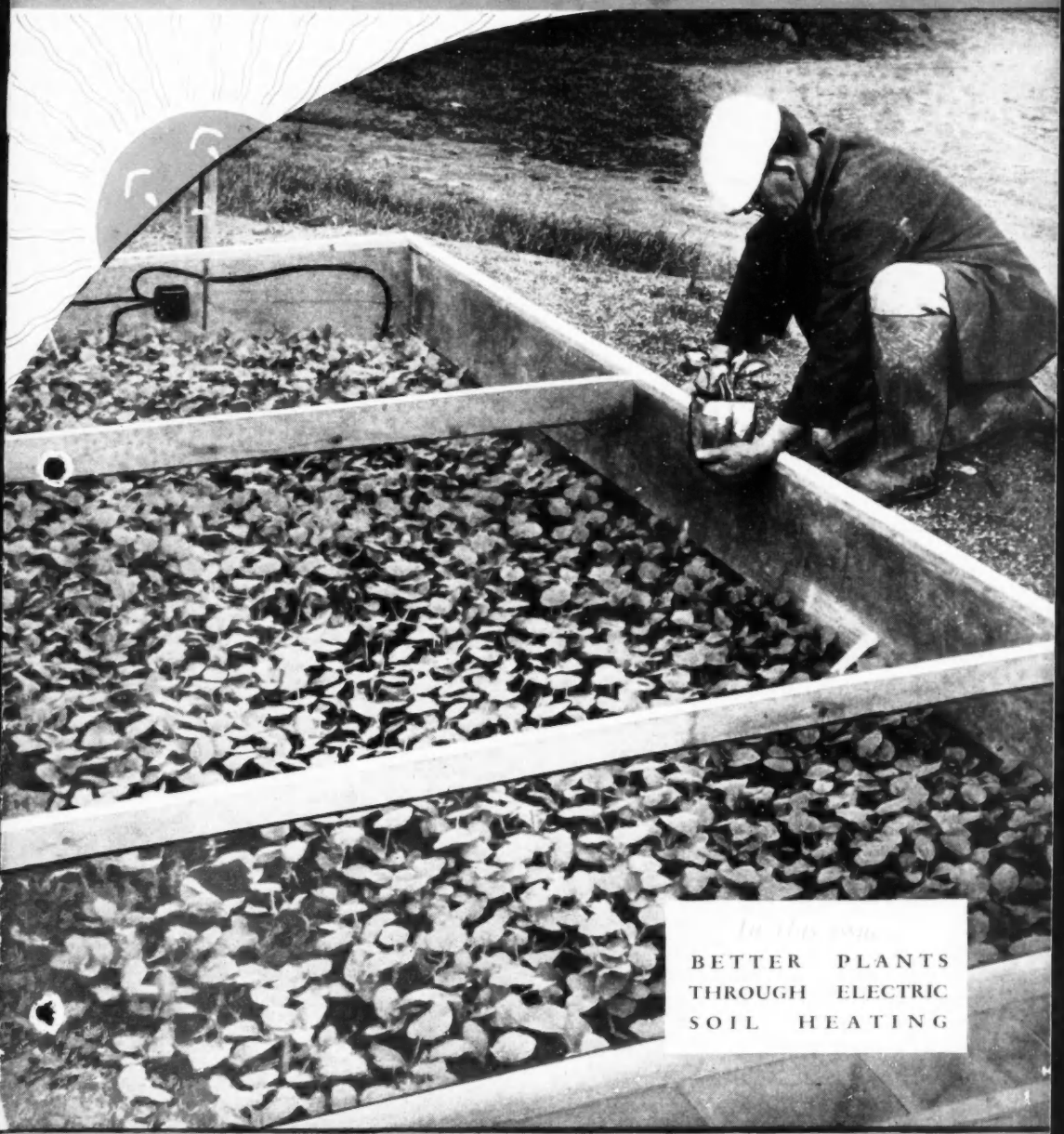
Electricity on the Farm

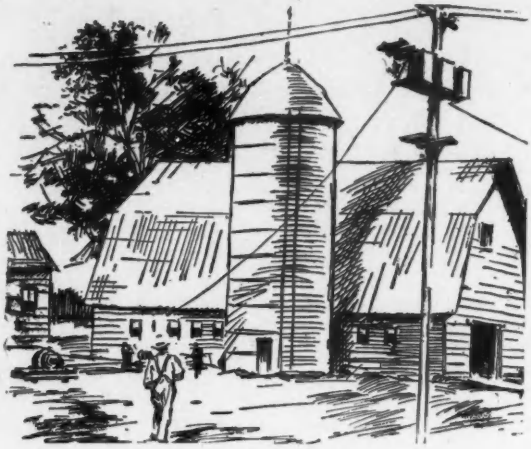
A MONTHLY MAGAZINE FOR THE UP-TO-DATE RURAL FAMILY



BETTER PLANTS THROUGH ELECTRIC SOIL HEATING

10 CASH PRIZES will be awarded for the best titles for the above picture. *(See inside back cover for rules)*

JANUARY 1934



How Much Does It Cost To Operate?

The answer to this all-important question for all the leading electric farm appliances has been obtained for you by the Central Hudson Gas and Electric Corp. To get these facts this company secured the cooperation of five typical farms that were being operated on a strictly business basis. Dairy, Poultry and Fruit farms were included in this group.

These farms were already equipped with most of the major electric appliances. The farmers agreed to use these appliances in the regular course of their work and separate meters were installed to record the current consumption for each piece of electrical equipment.

The figures given elsewhere on this page are average for three years of operation.

Operating Costs on Electrified Farm

WATER PUMP		
Current to pump 1,000 gallons	1.0	kwh.
MILK COOLING		
Current used to cool 100 lbs.	1.11	kwh.
MILKING MACHINE		
Current used, 1 cow, 1 year	.31	kwh.
MILK ROOM WATER HEATER		
Current to heat one gallon	.55	kwh.
GRINDING FEED		
Current used per 100 lbs.	1.21	kwh.
FILLING SILO		
Current used each ton	1.18	kwh.
SAWING WOOD		
Current used per cord	3.8	kwh.
HOISTING HAY		
Current used per ton	.64	kwh.
ELECTRIC REFRIGERATOR		
Current used each person, day	.51	kwh.
ELECTRIC RANGE		
Current each meal per person	.41	kwh.
ELECTRIC WATER HEATER		
Current to heat one gallon	.3	kwh.
WASHER & IRONER		
Current used per week	2.3	kwh.
ELECTRIC RADIO		
Current used per month	6	kwh.

Did You Realize That Electricity Would Work So Cheaply For You?

January, 1934
Vol. 7 No. 1

Electricity on the Farm

IN THIS ISSUE

Better Plants Through Electric Soil Heating

BY TRUMAN E. HIENTON

Electric soil heating has passed from the experimental stage to general acceptance in the middle west states. Florists, vegetable gardeners and others are finding that electricity will help them produce strong healthy plants in less time. The author presents much interesting data on this subject on page 4.

Dairy Stable Ventilation

BY A. M. GOODMAN

If in doubt as to the value of dairy stable ventilation, the article on page 7 with its convincing appeal as to its merits both from the standpoint of a healthy herd and preservation of building, should banish it completely.

The Grow's Business Grows

BY E. N. GATLIN

Electricity has been put to work on a wide scale on the L. B. Grow poultry farm near Tyler, Texas. Without electrically operated equipment their present production rate could not be maintained, according to Mr. Grow. Their story as told by the author on page 10 is an interesting one.

The Doom of the Dishpan

BY GAIL MEREDITH

The service days of the dishpan are numbered. Electricity has been instrumental in banishing other unpleasant tasks, and dishwashing is no exception. Several dishwashing units are illustrated and described by the author on page 12.

Regular Monthly Features

Electrical Housekeeping, page 14; On the Air, page 15; Questions and Answers, page 16; What's New, page 17.

EDITORIAL

DURING the past year history has been made at a furious rate. Concepts of the functions of the National Government have been shattered. More and more has the Government assumed a protective attitude toward agriculture, industry, and labor. More and more has it exerted its efforts to put all business on a profitable basis and at the same time increase purchasing power of the public and decrease unemployment.

Many innovations, which a few years ago would have been considered dangerously radical, are being tried out in an attempt to break the unprecedented depression.

That the measures taken are producing a beneficial effect cannot be denied. Whether the harm from excessive governmental expenditures will exceed the good accomplished may not be learned for years. But at least things are brighter today than for many months, and there is a most encouraging outlook all around.

That improvement will continue, that agriculture will again obtain its place in the sun, and that our readers may enjoy a New Year of prosperity and health is our earnest wish.

THE PUBLISHERS.

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BETTER PLANTS
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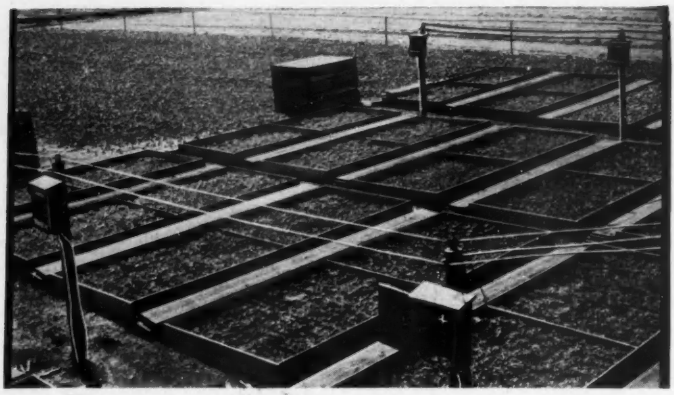


Electrically heated hotbeds near St. Louis, Mo. The size of the installation indicates the possibility of using electric heat for growing plants on a large scale.

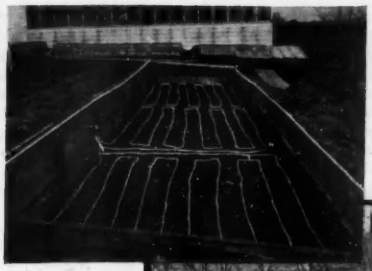
By T. E. HIENTON

FASTER and greater seed germination, increased percentage of cuttings rooted, reduced rotting in bedded sweet potatoes and maintenance of uniform temperatures are advantages of using electric soil heat cited by agricultural experiment station workers, vegetable gardeners, florists and canning company operators in the Middle West. Use of electric heating equipment to warm the soil in hotbeds and propagating benches has passed rapidly from the experimental stage to general acceptance by plant growers in that area, especially around the cities of St. Louis, Missouri, Chicago, Illinois, and Fort Wayne, Indiana.

Adolph Schilling, Ft. Wayne, Indiana, used his first electric hotbed, 6 x 24 feet, in 1932, then doubled the amount in 1933. After using manure for heat for many years Mr. Schilling says it cannot compare with the electric hotbed.

Electric soil heating received its initial impetus in the corn belt territory from the efforts and experiments of Prof. Ralph R. Parks of the University of Missouri working in cooperation with market gardeners in St. Louis County, Missouri, in 1929, 1930 and 1931. Results of this work were published in May, 1931, by the Missouri Agricultural Experiment Station in Bulletin 304 "Electric Hotbeds." As a result of Prof. Parks work and that of others, electric soil heating became of interest to florists and gardeners in the vicinity of Chicago, so that more than 50 installations have been made according to Mr. Richard Boonstra, agricultural engineer of the Public Service Company of Northern Illinois.

Experimental work on the use of electric heaters



Below: This 6 x 12 foot electric hotbed is located in west St. Louis County, Missouri. Electric heat insures good germination of seeds, an important factor in plant growing.

Above: This 6 x 36 foot hotbed heated by electricity, was used in 1933 by Val Kiug, Ft. Wayne, Ind., to raise flower plants. He is increasing the size in 1934 because of his success the past year.

Above: Two benches each with five 120-foot lengths of cable. Bench at left in operation. Cable laid out at right ready for connections. One inch of smooth gravel used under cable, with a covering of five inches of sand.

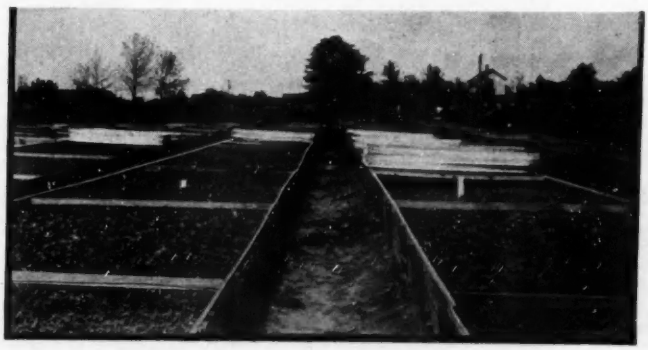
for soil heating was initiated at another agricultural experiment station in the central west, that at Purdue University, by agricultural engineers and horticultural specialists in the spring of 1931. Various types of heating units including strip heaters, individual units each with its own thermostat and soil heating cable were employed during the first year and compared with a steamheated hotbed. As a result of these tests, the lead-covered hotbed cable was selected as the most economical of the electric heaters, both as to costs of operation as well as those for installation, for the plant grower who wished to heat more than a few square yards.

Records were secured on installations by plant growers in Indiana in 1932 and again in 1933 as a continuation of the experimental work begun in 1931 to afford a more complete answer to costs of operation and effect of various factors. In all of the installations the heating units used by the grower were lead-covered hotbed cable.

During the two years, records were secured on seven hotbeds or propagating benches installed by florists, on 20 hotbed installations operated by plant growers or vegetable gardeners, on five hotbeds used for growing sweet potato plants and on six hotbeds in which tomato plants were raised by canning companies for distribtuion to their growers.

Florists have propagated evergreen and poinsettia cuttings, sprouted dahlia tubers and grown snapdragon, zinnia and aster plants successfully with electric heat. The cost for electric current used and equipment employed was small when compared to the increased rooting of cuttings and germination of valuable seed. Tomato, pepper, cabbage, celery, cauliflower, cantaloupe, cucumber, eggplant, lima bean and lettuce plants were produced economically by growers using electric heat for their hotbeds.

Electric heat was compared with manure heat in the production of sweet potato plants and it



Plants grown with electric heat on left and with steam heat on right by Matthews Canning Co., Matthews, Ind., in 1933. The white stakes visible in the foreground both extended 10 inches above the soil.

was found that with electric heat more plants were obtained per bushel of potatoes bedded, than with the other. This is due perhaps to the more even temperature and the reduced rotting of the bedded potatoes. First cost of tomato plants is an important item to the canning company whether they are raised or purchased. Results of two years' tests indicate that through careful use of electric heat for germination, for frost protection and for maintaining a moderate temperature during the growing period, it will economically produce tomato plants for the canning factory.

Many factors may influence the amount of energy used for heating soil with electricity. The soil temperature, outside air temperature, depth of hotbed frame in the soil, amount of soil or other material banked against the frame, whether or not insulated on sides or bottom, construction of the frame and use of cover on the sash at night are all factors which may influence the amount of energy used.

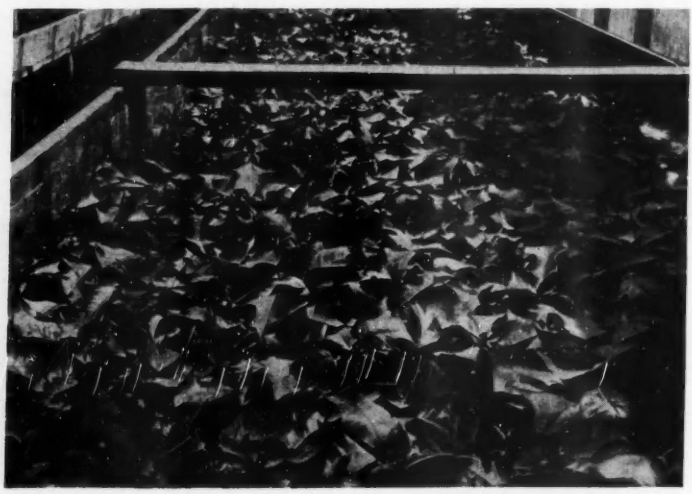
Observations of the author on the operation of electrically heated hotbeds during 1932 and 1933 indicate that higher soil temperatures are frequently maintained than are necessary with resulting excessive use of energy. According to Dr. J. H. MacGillivray of the horticultural department of Purdue University cool season crops, such as cabbage, cauliflower and lettuce will germinate at 60 degrees F. while warm season crops, such as tomatoes, peppers and eggplant will germinate more satisfactorily with a temperature of 70-75 degrees F. The night temperature during germination may be carried several degrees lower. After the appearance of a majority of the seedlings, the temperatures may be lowered to the following: 50-60 degrees F. for cabbage, etc., and 60-70 degrees F. for tomatoes, etc., on a sunny day, with temperatures at night and on cloudy days several degrees lower. Soil in which sweet potatoes are bedded should be maintained at a temperature of about 75-80 degrees F. until after the plants have begun to appear when a reduction of 65-70 degrees F. may be advisable.

In general, Indiana records showed that where hotbed frames were sunk into the soil or where they were banked with soil or other material when placed on top of the ground, a saving in use of electricity was made. One grower, who could purchase mineral wool at a low cost, built an extra wall outside the hotbed frame and filled the space with it with a resultant saving. Several others used cinder insulation from 4 to 6 inches thick on the sides and from 6 to 12 inches deep on the bottoms during 1933 with a saving of approximately 20 per cent in amount of energy used. Somewhat less saving was shown where such insulation was used only on the bottoms. Satisfactory results have been secured without use of any cinder insulation but where this is omitted, the frames should be set down into the soil or have the sides and ends well banked.

Covering at Night Saves Current

Covering the sash at night has been shown by the records to effect a saving in use of energy. Of the group studied during 1932 the two with lowest average use per unit of area heated used cover at night. During 1933 those using cover over the beds also used less energy than others operating at the same time. Various materials were used such as old blankets and discarded quilts, tarpaulins and commercial coverings made especially for the purpose.

Amounts of electricity used to heat hotbeds will vary widely depending upon many of the conditions mentioned. One of those not mentioned is probably as important as any other, namely the skill of the operator. A reduction of 30 per cent in energy used per square yard was noted when comparing 1933 records with those of the previous year. It is entirely possible that this may have been due to the fact that all of those included the first year were among the group the second year and that their experience had aided them in economizing in use of energy. The average amount of electricity used was 0.39 kilowatt-hour per square yard per day when the time is figured from the start of heating until the first plants are removed. Results of three years' investigational work have been issued in November by the Purdue University, Agricultural Experiment Station in Stencil Bulletin Number 6 (revised).



Electrically heated propagating bench full of poinsettia cuttings near Chicago June 1932. The healthy, sturdy appearance of the leaves indicates that practically 100 per cent have rooted. The cuttings were placed in the sand May 22 and photographed June 8.

Fig. 4. Inlet flue in stable with banked masonry wall. Arrows indicate where and how air enters stable.

DAIRY STABLE VENTILATION

By A. M. GOODMAN

SOMEONE once said that the reason the air in the country is so good is because all of the bad air is shut up in the cow stables. Few of us would agree that this is wholly true and yet we must admit that it is a lot nearer true than we wish it were. How often have we stepped into a stable where the windows are heavily coated with frost, where drops of moisture hung from the ceiling and where the air was humid and ladened with the strong odor of ammonia. In the loft of such a barn, if the siding is tight, we may find frost on the siding and on the underside of the roof on cold days, and on mild ones this frost melts and drips down onto the hay.

Contrast this with a stable that is dry and in which the air is fresh and good to breathe and where the loft is free from moisture and the hay is sweet and free from mold and dust clear to the bottom of the mows.

The first barn is characteristic of those in which there is no ventilation and where the moisture breathed off by the cows is left to condense within the building. The second is representative of barns where fresh, pure, dry air is allowed to come into the stable and stale stable air with its load of carbon dioxide and moisture is forced out of the building and never allowed to get into the hay loft.

A satisfactory dairy stable ventilation system must have definite places for air to enter the stable and there must be a definite place for air to go out and also a positive force to move this outgoing air. Let us consider first the fresh air inlets. We find that these give most satisfactory results when they have an area of about 60 square inches, that is 3″ x 20″ or 5″ x 12″. One inlet should be provided for not to exceed 4 cows and it is desirable to have one inlet for about every 3 cows. These inlets should be spaced about uniformly around the side walls. The inlets should

Fig. 1. Inlets on the wall behind the cows. The incoming air is directed straight up to the ceiling and never blows on the cows. Arrows indicate opening through which air is passed out of the stable to exhaust fan.

deliver the incoming air 12 or 15 inches below the stable ceiling and should direct it vertically upward toward the ceiling. The incoming air should not be conducted out into the stable but be delivered along the side walls.

There are reasons for all of the foregoing suggestions. First, the size of inlet is placed at about 60 square inches because experience has

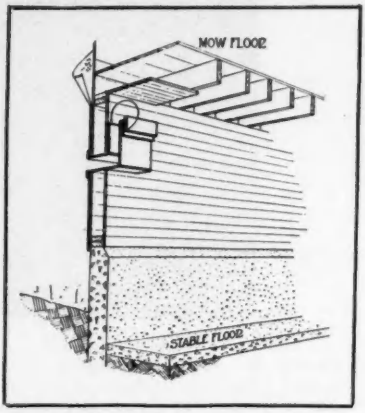


Fig. 2. Sketch showing construction of the simple inlet flue shown in Fig. 1.

shown that the air coming in through an opening of this size is about as much as can be admitted at one place during zero weather without making the part of the stable near the inlet too cold.

Second, the relation between numbers of cows and numbers of inlets is based on the amount of fresh air that is needed and the desirable velocity of air as it comes out of the inlet flues.

Three, thorough and uniform distribution is necessary to distribute the fresh drying incoming air to every part of the stable and to all of the livestock.

Four, the incoming air is directed straight up toward the ceiling so that it cannot possibly blow on the cows or those who work in the barn and so that it may immediately mix with the warmest air in the stable and thus have its temperature modified before it settles along the side walls to the stable floor.

Five, many carefully checked observations have shown that in any stable where there is no artificial disturbing influence the air settles along the side walls and rises about the cows. Delivering the incoming air only along the side wall stimulates this natural circulation of the stable air.

Inlet Flue Easily Constructed

A simple home-made inlet flue similar to those shown in the picture, Fig. 1, and the cross-section of which is shown in Fig. 2 have proved satisfactory for stables having frame or wooden walls.

In a stable with a masonry wall, whether the wall is banked or not an inlet constructed as shown in the sketch, Fig. 3, works admirably. One of these inlets as it appears in the stable is shown in Fig. 4.

During experimental work which lasted over 10 years, Prof. F. L. Fairbanks and the writer found and proved that one place is enough from which to remove air from a stable which may be up to 110 feet in length. The air may be allowed to escape through a tall insulated chimney, or it may be forced out of the stable by means of an electric fan or fans. The size of the fan will, of course, depend on the number of cows in the stable. A fan capable of exhausting approximately 60 cubic feet of air per minute per cow is desirable. For a stable of 20 cows this would require a fan about 16 inches in diameter; for 35 cows, about 18 inches in diameter; and for 50 cows a fan about 24 inches in diameter; or two

Fig. 5. Battery of four 12-inch fans exhausting the air from a stable housing 52 cows during experiments by Profs. Fairbanks and Goodman.

smaller fans could be used. It should be remembered that a fan should be selected on its capacity to move air rather than its diameter. The design of the blades and the speed of the fan both have an important bearing on the capacity of the fan.

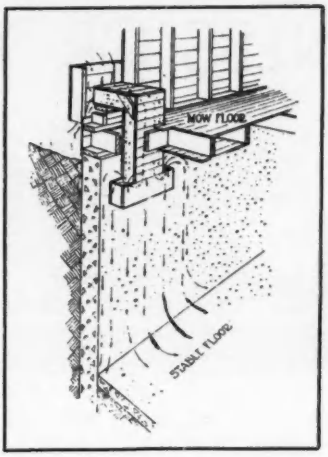


Fig. 3. Construction details of inlet flue for masonry walled stable.

The top of the outlet for the stale air should be not over 16 inches above the stable floor so that only the coolest air in the stable will escape. Since the air within the stable is constantly circulating, the air near the floor though cooler than that near the ceiling contains the same amount of moisture. The fan may be placed in the side wall with the bottom of the fan at or below the level of the stable floor as shown in Fig. 5, or the fan may be up near the ceiling with a flue reaching from the fan down to within 16 inches of the stable floor. Do not place the fan so that it will have to discharge into the prevailing wind.

The exhaust fan may be placed at the ceiling and controlled by thermostats. The obvious and very real objection to this arrangement is that when running the fan removes the warmest air from the stable. This results in the lowering of the stable temperature and the action of the thermostat which stops the fan. When the fan is stopped there is no further ventilation until the temperature rises and the thermostat again starts the fan. During this time the moisture is obviously accumulating in the stable.

In a wooden walled stable where the inlet flues come through the side walls a ventilation system using an electric fan to exhaust the air may be installed in a short time during any season of the year whether the mows are empty or full of hay.

The amount of electric current required to run the little motor of a fan is surprisingly small.

A well ventilated stable is a far more healthy place for the herd and for those who care for it than is the stable full of damp, foul-smelling air. The saving on the barn timbers and roof due to keeping them dry by forcing the damp stable air directly out of doors rather than permitting it to condense its moisture in the loft is enough to more than offset the cost of building and operating a good, well planned, simple ventilation system. The improved condition for the live stock and the dairymen and his men may be put down to clear profit.

Water-System Noises

Rumbling noises in a farm water system can usually be eliminated by setting the water back or heating element level in the kitchen range so that the hottest water may circulate freely instead of being trapped and converted into steam, which causes the rumbling, says the Bureau of Agricultural Engineering, U. S. Department of Agriculture.

The water back usually is a hollow iron casting, set in the kitchen-range fire box opposite the oven. It has two tappings—inlet and outlet—for ¾- or 1-inch pipe. The lower tapping or inlet and the upper tapping or outlet are piped to low and high connections in the side of the hot-water supply tank. The upper tapping should be flush with the inside top of the water back.

In a furnace, the fire-box or pipe should be either level or, preferably, arranged to allow a continual rise from cold-water inlet to hot-water outlet. Often the circulation may be improved by using larger or better-pitched hot-water pipe from the coil or water back to the boiler.

Most noises in boilers and pipes are caused by slow, air-bound, or overheated circulation. A hot fire may intensify the rumbling in a boiler and pipe until it seems like a violent pounding. It is poor economy to heat water faster than used at the faucets. Steam at faucets indicates that the boiler water is above boiling temperature and not that the boiler is filled with steam. Faucets should not be closed so quickly as to cause the familiar pounding noise known as water hammer.

New Jersey Flock Owners Reduce Poultry Mortality

By reducing chick mortality New Jersey poultry farmers have demonstrated that sanitation is an effective weapon against parasites and disease.

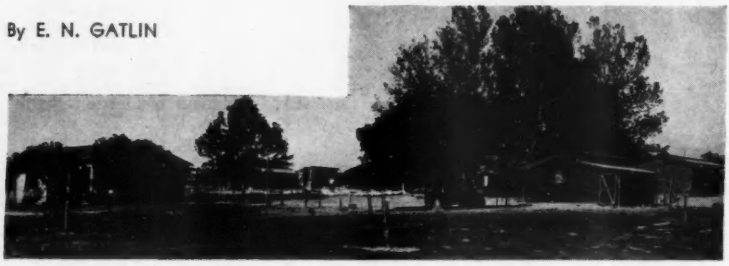
The United States Department of Agriculture has been cooperating with State agencies in New Jersey and several other States in a 7-point program of parasite and disease control. Briefly these seven points are: (1) Hatch or buy chicks early; (2) keep the brooder houses clean; (3) either provide clean range or keep stock in close confinement; (4) separate old and young stock; (5) keep manure pits screened; (6) provide poultry wire just above the dropping birds; and (7) clean the dropping boards daily.

Poultry raising is an important farm enterprise in New Jersey. Poultry specialists in that State have worked with Federal specialists for more than 5 years, driving home to poultrymen the idea that it pays to "wage war on worms and disease." In the New Jersey campaign particular emphasis has been placed on the first three points.

Results have proved the value of the program, according to the Department. In 1928 the average loss in flocks of the 344 poultrymen who cooperated was 18.6 per cent. These poultrymen, it is noted, were better than average and were willing to take pains to cut losses. By 1932 there were 961 flocks enrolled and losses had been cut on the average to 13.4 per cent. This gain of more than 5 per cent. in the number of chicks saved represents a decrease of nearly 30 per cent. in the number of chicks that died. In flocks where the full 7-point program was in effect mortality was as low as 7.4 per cent.

The GROW'S BUSINESS GROWS

By E. N. GATLIN



A general view of the L. B. Grow poultry farm at Tyler, Texas.

THE L. B. Grow Poultry Farm near Tyler, Texas, presents a fine example of how to add to the profits from a poultry farm by increasing the production of the farm with a minimum of expense for labor and equipment. The farm is engaged in the production of eggs and frying-size chickens for the market. It has facilities for handling 1,750 young chicks, and this capacity is maintained during the months of December, January, February, March and April.

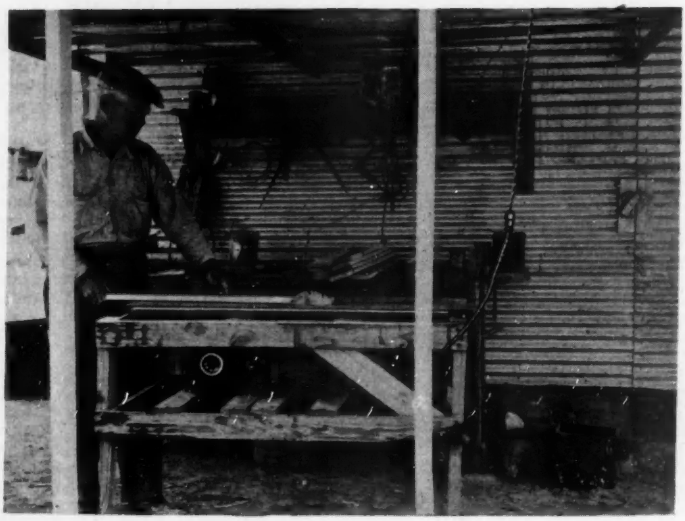
The farm is handled entirely by Mr. and Mrs. Grow without the assistance of any outside help. However, Mr. Grow says that running it on the present scale without the aid of electricity would necessitate employing two hired hands during the incubation season. Mrs. Grow is the captain. Mr. Grow is the first mate, and electricity handles the bulk of the labor. It is used for cooking, refrigeration, residence lighting, water heating, miscellaneous household appliances, water pumping, incubation, brooding, lighting for increased egg production during the winter months, yard lighting and to run a farm shop portable motor. All of these uses were developed in a period of three years.

Mrs. Grow is very fond of her chickens and likes to work with them. So, in order to reduce her household duties to a minimum they purchased an electric range and several pieces of household labor-saving appliances. The automatic features of electric cooking make her presence in the kitchen unnecessary while the meals are cooking and she is, therefore, free to attend to the outside details connected with the chickens.

Pump Provides Running Water

To avoid carrying water to the chickens and to provide for various other water requirements on the farm, they installed an automatic pressure pump, which provides running water under ample pressure in the residence, in the chicken houses and over the premises.

Of each group of 1,750 chicks hatched out last season about 95 per cent were raised for the market. By their former methods of brooding Mr. and Mrs. Grow say that they did well to raise 75 per cent of their chicks. The difference of



Mr. Grow's workshop is equipped with a motor-driven saw. It is one of his pets, he says, and saves him much time in doing carpentry work about the farm.

This poultry house contains facilities for brooding 1,750 chicks.

20 per cent in mortality represents a net gain of 350 chicks raised due to the use of electric brooders. At 80c, which is the average price received per chicken 350 chicks bring $280 additional gross profit out of each group of 1,750 brooded with electricity. The Grows attribute their low losses to the even temperature and the dry and odorless heat which electric brooding affords. They also claim that chicks hatched and brooded with electricity are more vigorous and weigh more at the market age than chicks hatched and brooded by the methods formerly used on their farm.

Another generally recognized advantage is a lower investment in housing facilities. Mr. Grow says brooding 1,750 chicks with brooding methods used prior to obtaining electric service would require double the present building capacity, requiring an extra investment of around $300.00. He further says that if they had to return to their former methods of brooding, he would need 15 more brooders than he now has, at an additional cost of $225.00.

Building the farm up to its present capacity has necessitated a considerable amount of carpenter work. Mr. Grow, being a good mechanic, has done all of that work. The motor driven saw illustrated herewith is one of his pets. He says that it is such a labor-saver that he can now, with its assistance, build in two hours the same amount of coops, or shipping crates that formerly required about eight hours.

Lights Increase Egg Production

Lighting in the laying houses has increased the winter production of eggs about 25 per cent; however, they have not determined yet the yearly dollar and cents profit that this use of electricity is netting them. A yard light which burns at night has paid for itself many times. Such a light is not inviting to chicken thieves.

A summary of what the Grows have done is as follows: They have built up the production of their farm to where its operation without electricity would require a yearly expenditure of about $350.00 for labor. This amount of $350.00 is a net saving, inasmuch as their total cost for electricity is quite a great deal less than the cost of an equal amount of the former fuels used. They have raised each year about 1,100 chickens that would have been lost by using former methods. They have reached and maintained a production capacity of 1,750 chicks at an initial saving in buildings and equipment of $525.00.

WHAT OUR READERS SAY

Electric Aids

To the Editor:

I am very well pleased with the helpful suggestions as well as the news contained in the monthly magazine ELECTRCITY ON THE FARM. I think the front cover always illustrates electrical aids that really assist the farmer in shortening his working hours and in maintaining more sanitary conditions.

PYATT JACKSON
DuQuoin, Ill.

Romance

To the Editor:

There is always a beautiful romance in our lives, and when I saw the picture on the front cover of your magazine, it brought to my mind the many times I have listened to my husband dreaming of the things he would obtain for my pleasure and convenience when our farm was electrified.

I have not waited in vain, for we now have electricity. What a magic word; it has made our wishes come true! We have a washing machine, stove, radio, irons and lights.

MRS. J. W. MARY
R. L., Box 32, Central Point, Oregon.

"On her eighteenth birthday I gave my daughter her first front door key."

"That was the proper modern spirit, old man."

"Not necessarily—I just got tired having her knock off the milk bottles crawling through the pantry window."
—Pitt Panther.

Save money by installing your water system NOW! And save trouble and expense later on—by choosing a Myers system that you can depend on absolutely. Like all Myers products, they are highest quality through and through! Myers has never built a "bargain" water system.

Write us today — for free booklet and name of your Myers dealer.

THE F. E. MYERS & BRO. CO.
361 Fourth Street Ashland, Ohio

The DOOM OF THE DISHPAN

HERE LIES

Epitaph from an ancient gravestone in a New England Graveyard

Here lies an old woman who always was tired.
She lived in a house where help was not hired.
Her last words on earth were,
"Dear friends, I am going
Where washing ain't done,
Nor sweeping, nor sewing.
But everything there is exact to my wishes.
For where they don't eat, there's no washing of dishes.
I'll be where glad anthems forever are ringing.
But having no voice, I'll be clear of the singing.
Don't mourn for me now; don't mourn for me never.
I'm going to do nothing forever and ever."

By GAIL MEREDITH

THE new dishwasher sinks are well designed to make us discontented with a dishpan. They are as beautiful as they are efficient. Some sinks are porcelain, white or colored, with shining metal covers for the dishwasher tubs. The cover makes one of the drainboards for the rest of the sink. Others are made of silvery, stainless metal. These have straight lines and both dishwasher and sink are built into cabinets that fit neatly into the new kitchen designs. The top of the dishwasher and the second drainboard of the sink, if it has two, may be either an acid resisting, vitreous enamel or the stainless metal. One of the new models opens on the side like an oven so the top is left entirely flat for a work space.

With the dishwashing machine built in as it is, the sink need take up no more space than an ordinary one that will not wash dishes by itself.

If you never have seen a dishwasher at work, let me tell you what it is like and how it gets the dishes clean.

Most dishwashing machines have tubs much like a washing machine, with some motor driven contrivance in the bottom or up the center for sending the water over the dishes, front and back. There are racks to hold the dishes, generally two. In all but one of the dishwashers I know about, these racks stand still. In that one the basket turns slowly around.

The force of the hot water, plus a good dose of soap powder and water softener, washes the food from the dishes as it surges against them. A trap in the bottom of the tub catches any stray bits of food that may have been left when the dishes were scraped.

Since these dishwashers are connected with the plumbing of the house, they need no water carried to them, and none taken away. You turn a faucet to let the water into them, and a lever to drain it out. You press a button to start the motor that runs the machinery, and you push it back again to stop it.

Separate dishwashing machines that are not part of the sink can be connected to the water system, too, and set up next the sink, if that is the most convenient place. They operate in the same way.

Then for kitchens that refuse wall space to either of these, there are portable dishwashers.

When the cover is down it makes a drainboard.

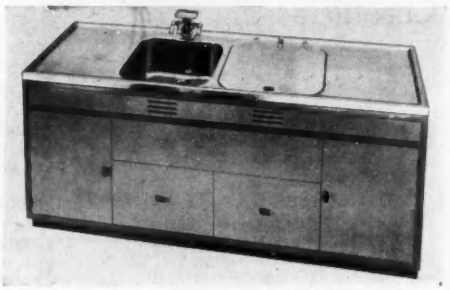
These can be rolled up to the sink at dishwashing time, and filled through an arm that swings up under the faucet. They empty out of a pipe that reaches over the edge of the sink.

One of these portables is low enough to roll under the sink out of the way. Another is built square and looks like a fine enamel cabinet. It has a smooth top that makes a table of it when the dishes are put away. Both of these machines roll easily on large casters.

Does an Excellent Job

Taking them all in all, these dishwashers make the future of the dishpan look gloomy enough, for there is no reasonable doubt that a dishwasher is far better than a dishpan for doing dirty dishes. It is better for folks and it is better for dishes.

The machine washes dishes cleaner than we can possibly do by hand. It does not use a dish cloth: it floods them with water again and again;



With the dishwasher at the right of the sink and generous working space at the side.

it rinses them thoroughly, and that before the wash water has had a chance to dry on them. And for both washing and rinsing, it can use water a good deal hotter than we can put our hands in.

Women used to be afraid that a machine would break dishes, but we have learned that it does not. Dishwashers are built so that even though the water whirls and dashes about the tub, it does not knock the dishes around. The action is really gentle. On some of the machines the racks are covered with rubber so there is slight danger of breaking the dishes when packing them for washing.

Ready to wash the dishes.

In fact it seems that the machine may actually cut down breakage because it cuts down the handling, and it is in handling the dishes that we nick and drop them, of course.

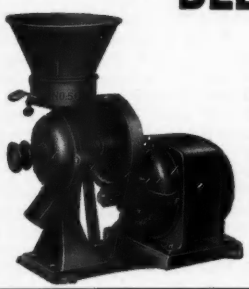
If we could have one, I believe all of us would be glad to turn over to a machine a job it can do better than we can, especially a nagging, three times a day job, an every day in the year job, like washing dishes. And when we consider that it will save a good deal of the time we are now spending over the dishpan, too, that makes another strong appeal to good managers.

Perhaps you who are reading this do not think dishwashing takes much time. But consider these figures for a minute.

It is estimated that in an average home there

(*Continued on page* 18)

Low Prices **BELL FEED GRINDERS** *High Quality*



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Will Grind all Grains that are profitable to grind.

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Manufacturers of Feed and Food Grinders since 1858.

ELECTRICAL HOUSEKEEPING

Conducted by
GAIL MEREDITH

For the PLANTS INDOORS

MY husband's Aunt Marjie lives in a very old stone house whose walls are so thick that every window ledge is a broad shelf. There she keeps her plants, often moving them from one window to another as the sun moves around the house.

I thought of her the other day when I discovered this new plant stand that can be used anywhere regardless of the sunlight, because it carries its own light with it.

For a good many years various organizations have been studying the stimulation of plants and vegetables by means of artificial light. They have found out that they can grow some plants with artificial light alone; that they can bring some to bloom early, or entirely out of season by adding to the daylight with lamps. They find that they can light some plants for twenty-four hours a day, but others grow best when the daylight is lengthened only a short time. They have even found that just a little light, what the lighting engineer calls a relatively low intensity, will keep plants growing and thrifty in places where the daylight alone is not enough.

Many plants thrive under electric lights.

Decorate Corners and Hallways

That is why manufacturers have devised a stand like this. It will hold, as you see, five flower pots. The light comes from a 60-watt lamp with an aluminum reflector. The parchment shade is added for looks. With it you can use your plants to decorate corners and hallways where daylight alone would not suffice to keep them thrifty.

Begonias, geraniums, salvia, hyacinth, cineraria, cyclamen, Boston fern, ivy, and oh, many other flowering and foliage plants can use to advantage 16-18 hours of light in every 24. Of course that is far more than they can possibly get in the sunniest window during the short winter days.

If you have an idea that you would like to light your house plants regularly, you can get helpful information from the United States Department of Agriculture at Washington, D. C. Or if you would like to try some such stand as this with the light all in place, the amount, and distance from the plants all figured out for you by careful engineers, I will be glad to tell you where it is made.

The Chronicles of a cook— SPOON BREAD

COOKING! More cooking! Always cooking! As my grandmother's second cousin used to say when she'd come over at times to help out in some domestic crisis.

"Cooking isn't so bad. I sort of like to cook. What gets me, it's so plumb constant."

The other day I suddenly remembered the spoon bread we used to have at the Dacon's when we were living in South Carolina. I hunted through svereral cook books but recipes for spoon bread seem hard to come by. So I sat down and wrote to a friend of mine who works in the Home Economics Department at the University. I thought she ought to know how to get hold of a recipe.

And she did. She sent it back by return mail, a recipe from the Bureau of Home Economics of the United States Department of Agriculture. I started right in and made some for supper. All I had with it was a big cabbage salad, apricots and hot gingerbread. The spoon bread was so good that all the family came back for second helpings. Even Shawnee, our half grown Persian, fairly purred over the crumbs.

It is easy to make. I am giving you the recipe so you can enjoy it this winter.

1 cup corn meal	1 cup milk
2 cups cold water	2 or 3 eggs
2 teaspoons salt	2 tablespoons fat

Mix the meal, water and salt, and boil for 5 minutes, stirring constantly. Add the milk, well beaten eggs, and melted fat, and mix well. Pour in a well greased hot pan or baking dish and bake for 45 to 50 minutes in a hot oven, 400 degrees. Serve from the pan or dish in which it was baked.

A comfortable, homely name, spoon bread, but the dish is one of the most inspired concoctions southern cooks have contrived from corn. It is almost custard like in texture, and you serve it with a spoon, but eat it with a fork. It is one of those dishes that bob up neatly with bacon and eggs for breakfast to take the place of any other cereal; that appear quite properly on the dinner table, edging out potatoes or rice; and that are hearty enough for supper, too, with a salad and dessert.

ON THE AIR

Conducted by Jerome J. Henry

CBS Follows Byrd Expedition

EACH week during the winter we may tune in our CBS stations' broadcasts originating with the expedition into the Antarctic which is Admiral Richard E. Byrd's second venture to the bottom of the earth.

The Columbia Broadcasting Company has assigned two men to handle the broadcasts. They

Elsie Hitz, one of the Columbia Broadcasting system's favorite dramatic stars.

are now with Admiral Byrd on the expedition. Their task is to handle the radio programs, send them out over short wave facilities, and all of the other activities generally associated with the planning and broadcasting of a radio program.

One of the wonders of radio, these broadcasts through the winter months will undoubtedly lead us all to a more profound respect for the magic that is radio.

• • •

Hear March of Time for Dramatic News

FOR several years during the winter months the March of Time broadcast over stations associated with the Columbia Broadcasting System has been a favorite program among those of us who enjoy radio news.

Presented each week this program dramatizes outstanding news events. So experienced are the radio actors who take the parts of the various personalities who make news that it is often impossible to distinguish between their voices and the voices of the persons whom they are representing.

In addition to giving leading news events in fascinating style the program contains rousing music and an air of speed that may give listeners a feeling that swiftly and surely "Time marches on."

• • •

Old West Melodramas on the Radio

MELODRAMAS of the Old West, with songs of the mountains, the range, the saddle, and the open spaces are now being heard on the radio through the presentations with Carson Robison and his famous Buckaroos in a series of Sunday broadcasts over NBC stations.

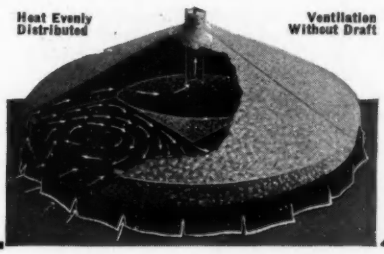
The series, known as the Bar X Ranch, contains pleasing music which serves as a background to the dramatized thrillers of early Western life, Robison and his group are well known over the air, since they have been starred in a number of network programs.

Robison himself is a native of the Ozark Mountain region, and he is regarded as one of the outstanding exponents of tunes of the plains and backwoods. He has composed more than 200 songs in the early American folk tradition.

• • •

Something in Common

"Well you've gotta admit," says Louise Starkey of Clara Lu 'n' Em, "that modern girls have something in common with their grandmas—they love spinning wheels."



Announcing
the New
TRUMBULL ELECTRIC BROODER

The Brooder with the Inverted Cone

The inverted cone, a patented feature of the new Trumbull Electric Brooder, keeps the warm air in circulation causing an even distribution of heat under the entire hover.

The Trumbull is heat-insulated, making its use practicable in any well-constructed brooder house. Equipped with automatic, dependable temperature regulation. Accommodates 350 chicks without crowding. Operates on 110 or 220 Volts A.C.

A thoroughly practical and tested Electric Brooder, economical in current consumption.

Write for illustrated folder and prices.

THE TRUMBULL ELECTRIC MFG. CO.
Dept. W-12 Plainville, Conn.

A GENERAL ELECTRIC ORGANIZATION

Questions and Answers

Conducted by H. J. GALLAGHER

Question: *What is inductive interference?*

Answer: Any wire carrying an alternating current is surrounded by a magnetic field of force. Any wire that lies within a magnetic field of force becomes a conductor of induced current.

The breadth and intensity of the magnetic field of A. C. transmission line is in proportion to the voltage on the line. Other lines close enough to the transmission line to lie within its magnetic field become conductors of induced current. That may cause a buzzing on the telephone or chattering of telegraph instruments.

This phenomenon of induction which causes one energized wire to induce a current in another wire is the basic principle in the generation and transmission of electric service. It is the basis of operaton of all A. C. motors which are generally termed induction motors.

The annoyance sometimes caused by inductive interference is of little consequence as compared to the value of electric service.

The majority of power companies are using corrective measures to reduce inductive interference and it is becoming less serious each year as protective equipment is improved.

Question: *Why is aluminum wire so often used for farm service instead of copper wire?*

Answer: Aluminum tranmission wire consists of strands of aluminum wire around a core of galvanized steel. The steel core of the cable gives it higher strength than its equivalent in copper. Consequently longer wire spans with less poles can be used. This helps in reducing the cost of building farm lines and makes it possible for more farmers to have service.

A cable quite generally used consists of six strands of aluminum wound around a single strand of steel wire.

Steel reinforced aluminum cable is not as good a conductor as copper. Consequently a larger cable must be used to offset the greater resistance. The cost per foot of the two materials for the same job is about the same; the aluminum costing more per pound but weighing less per foot.

The aluminum cable having a greater diameter than the copper cable saves electricity by reducing the corona discharge.

Question: *At what speed should a drill press operate?*

Answer: The correct speed of a power operated drill press depends primarily upon the size of the drill used and the type of construction of the drill. Of the two common types of drills, carbon steel and high speed steel, the latter should operate at approximately twice the R. P. M. of the carbon steel drills.

Recommended speeds from 1/16" to 1" diameter for drilling wrought iron machinery steel or soft tool steel are:

Drill diameter inches	Carbon Steel	High Speed Steel
1/16	1,834 R.P.M.	3,057 R.P.M.
1/8	917	1,528
3/16	611	1,020
1/4	458	765
5/16	367	612
3/8	306	510
7/16	262	437
1/2	229	382
5/8	184	306
3/4	153	255
7/8	131	218
1	115	191

Question: *What makes the disc in an electric meter revolve?*

B. MOORE, Hammond, La.

Answer: The electric watt-hour meter is operated by an electric motor. The speed of the motor varies with the amount of current flowing in the circuit to which it is connected. The revolving element of the motor is connected to a series of gears. Gear No. 1 drives gear No. 2; No. 2 drives No. 3, etc. Ten revolutions of gear No. 1 produce one revolution of gear No. 2. When gear No. 4 has completed one revolution, gear No. 3 has completed ten revolutions, No. 2 one hundred and No. 1 one thousand.

Question: *I have an extension cord with a pull chain socket in which is a 60 watt lamp. Why does the socket get hot?*

Answer: The heat from the lamp is conducted to the socket. Some sockets are so well insulated they do not become warm. Other sockets with less insulation are heated more readily.

Save 20%
of your Cooking Time—
and cut cooking costs.
CHROMALOX
SUPER SPEED RANGE UNITS
Mrs. George Zimmer says:
"Our Chromalox Top burners heat and cook much quicker. They are far ahead of the old units."
Try Chromalox Free on your own range without obligation.
Ask your Power Company for details or write to EDWIN L. WIEGAND CO., 7580 Thomas Blvd., Pittsburgh, Pa., Manufacturers Chromalox Electric Heating Units.

ESCO
The Electric
MILK COOLER
increases profits, cuts costs, saves labor. Cools milk quickly to below 50 degrees and keeps it cold until shipped.
The ESCO Electric Dairy Utensil Sterilizer destroys bacteria as it dries cans and pails. An automatic time and profit saver.
Send for information. Ask also about ESCO Electric Water Heaters.
ESCO CABINET CO.
180 East Market Street
WEST CHESTER, PA.

What's New

Reviewed by T. E. HIENTON

Electric Fanheater

Electric heaters are probably of greater use in the farm home and about the farm than in town or city home or business. Newly born pigs and lambs often may be kept alive at birth by the use of a small heater in farrowing pen or lambing shed. Sick rooms in farmhouses without furnace heat are made more cheerful as well as comfortable through their use.

A recently announced fanheater is the product of a middle western manufacturer. This device is 9½ by 6 inches at the base and is 12 inches high. It operates on 110 to 125 volts, 50 to 60 cycle, alternating current. At 110 volts this fanheater will use approximately 1,275 watts. The cabinet of new design is finished in mahogany crackle.

New Model Dairy Sterilizer

Electric heat is steadily finding greater productive uses on farms. Incubators, brooders, poultry water heaters, hotbeds and propagating benches, soil sterilizers and dairy sterilizers are all being heated economically today by electric heat.

A company which was one of the pioneers in the manufacture of the dairy sterilizer recently announced a newer, smaller model designed particularly for sterilizing strainers, milk pails, etc. This model, 34½ inches long, 20½ inches wide and 37½ inches high including legs, is small enough to be housed easily in any dairy room. It has a capacity of four 14-quart pails and strainer or two 40-quart cans at one time. Two 500-watt heaters for 115 or 230 volts provide heat for the sterilizer. Construction is of rust-resisting galvanized iron, with one inch of insulation, and a finish of aluminum steel coat.

Splash and Drip-Proof Motors

Motors used on farms are frequently exposed to rain and may be subject to spillage. Pump, feed grinder and elevator motors may often be left without overhead protection of any kind and

MOTOR IN HANDLE

STEWART Clipmaster

A Fine, Fast and Economical Electric Cow and Horse Clipper

The Clipmaster is a completely self-contained machine with an extra good universal motor inside the handle. You simply plug in at any electric outlet and clip away easier and better than ever before. Specially designed ball bearing tension uses very little pressure and the plates retain a keen cutting edge for a remarkably long time. Built strong and sturdy throughout. Complete with 20 feet of rubber covered 3-lead cord. Other clipping machines as low as $12.50. At your dealers or send us $2.00. Pay balance on arrival. Send for complete catalog showing the entire line of Stewart clipping and shearing machines.—Chicago Flexible Shaft Company, 5524 Roosevelt Road, Chicago, U. S. A. 44 *years making quality products.*

$18.50

THESE ELECTRICAL DEVICES WILL MAKE MONEY FOR YOU

Now is the time to find out what help electrical equipment can be. Many of your questions can be answered most satisfactorily by our advertisers. Read the advertisements carefully, for these manufacturers are best equipped to help you and will answer your questions without obligation.

FOR WATER SUPPLY:

Automatic Water Systems (*see advt., page* 11)—Pump Jacks—Water Heaters (*see advt., page* 11)

FOR THE DAIRY:

Milking Machines—Milk Coolers (*see advt., page* 16)—Cream Separators—Churns—Bottle Washers—Dairy Sterilizers (*see advt., page* 16)—Clipping and Grooming Machines (*see advt., page* 17).

FOR POULTRY:

Incubators—Brooders (*see advt., page* 15)—Time Switches—Drinking Fountain Warmers (*see advt., page* 15)—Ultraviolet Light.

FOR THE HOUSEHOLD:

Ranges—Refrigerators—Clothes Washers—Vacuum Cleaners—Ironing Machines—Dishwashers—Flat Irons—Food Preparing Machines—Ice Cream Freezers—Sewing Machines—Table Appliances—Clocks—Range Replacement Units (*see advt., page* 16)—Floor Polishers.

FOR REPAIR AND MAINTENANCE:

Soldering Irons — Tool Grinders — Drills — Paint Sprayers—Woodworking Machinery—Motors.

MISCELLANEOUS:

Feed Grinders (*see advt., page* 13)—Ensilage Cutters—Corn Shellers—Hay Hoists—Feed Mixers—Stationary Spray Plants (*see advt., page* 11)—Burglar Alarms—Ventilators—Soil Heating Equipment—Radio Sets.

Any other information that you need will be supplied if you will fill out and mail this handy coupon.

- - - - - - - TEAR OFF HERE - - - - - - -

Electricity on the Farm, 24 W. 40th St., New York

Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying.

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My name is .....

Address .....

.... 1-34

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should be splash-proof where such a condition exists. Separator and churn motors are subject to spillage and, unless a cover is provided, should also be of splash-proof construction.

A new line of splash and drip-proof motors has been announced by a well known motor manufacturer. This construction can be furnished in all of the various types of motors manufactured which include single and three-phase a. c. motors and also direct current motors. Motors of as small as 1/6-horsepower rating are available and all motors can be had with either sleeve or ball bearings. Of particular interest is the fact that these motors are less expensive than the totally enclosed motors. An opening in the bottom of the frame provides an outlet for condensation or other moisture.

Fractional Horsepower Motor for Water Pumps

Pump motors usually receive severe usage on the farm and the failure of the pump motor will be noticed more quickly than any other. The announcement of a motor specially designed for driving small water pumps is logically of interest to all people living on electrified farms.

This new line of single-phase motors is available in one-sixth, one-quarter and one-third horsepower ratings. Features of this motor, according to the manufacturers are that it is drip-proof and has flanges to prevent dripping water from entering the motor. Also, and perhaps of greatest importance to the farm user, there is a large bearing-oil capacity which makes oiling of the motor unnecessary more than once a year. The necessity for splicing and soldering connections is eliminated by a built-in terminal box.

Farm Plumbing

To give reasonable service in an ordinary farm house, the water pipes should be large enough to deliver not less than 3 gallons of water a minute to each faucet or valve at a sink, washstand, bathtub, water-closet tank, and small shower, according to the United States Bureau of Agricultural Engineering. They should be large enough to deliver 5 gallons a minute to each outdoor faucet. Seldom are all fixtures used at one time, but for short periods a family of six may use combinations of fixtures that require 15 to 20 gallons a minute.

Weak flow at faucets is often caused by small or clogged distribution pipes. In general, branches longer than 25 feet or supplying two or more small fixtures should be constructed of pipe at least three-fourths inch in diameter.

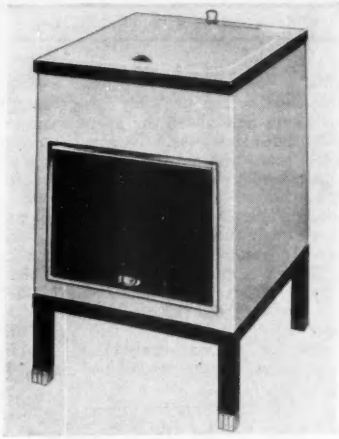
The Doom of the Dishpan

(*Continued from page* 13)

are twelve acres of dishes to do every year. If a woman does them alone, it will take her, says the statistician 40 days of 10 hours each. Forty days of each year with her hands in a pan of dishwater—and long days at that. There should be a code!

If the dishwashing machine saves half of that time, as it seems quite possible that it may, there is a vacation of almost three weeks right there.

The saving of time is bound to vary with the way we organize our work and how much time we took for the job before. If the size of our



The front of this dishwasher pulls out for a shelf to hold the dishes when you are getting them ready to pack in the machine.

family permits, we can wash dishes just once a day, scraping them and stacking them in the machine after each meal, so leaving the kitchen tidy. It takes no longer to do the actual washing of the dishes for all three meals than one. Perhaps we will have to wash them twice a day, and even that cuts down the time some. And of course the washing goes forward much faster than it did by hand.

There is very little wiping to do. If the rinse water was really hot, we can lift the cover and let the air strike the dishes. They will be dry by the time we are ready to put them away. The silver and the glasses need polishing, ordinarily that is all.

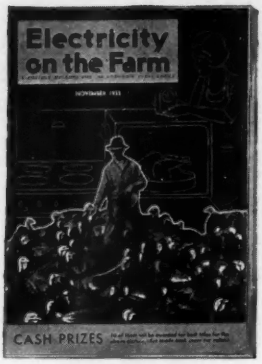
Will it wash all the cooking dishes, too? Probably not. Some kettles are too bulky to fit into the machine. Dishes with food burned on must be scraped and scrubbed by hand, and when that is done, they are really washed. Some women do a good many of their cooking dishes in the machine, and some wash all their pots and pans by hand while the machine is doing the rest.

CLASSIFIED ADVERTISING

The PARAGON POULTRY TIME SWITCH is scientifically designed and approved by state universities. It provides automatic control both morning and night and DIMS THE LIGHT AT NIGHT to allow the hens to return to roost. Low price and UNCONDITIONALLY GUARANTEED. Write for full information today. PARAGON ELECTRIC COMPANY. Van Buren and Dearborn Sts., Chicago, Ill.

ELECTRIC BROODER PARTS—Build your own Electric Brooder. We furnish parts—Thermostat Switch, Heating Element, Drawings. With our instructions, common tools and ordinary ability you can construct successful brooders at minimum cost. Write today. INTERSTATE SPECIALTY CO., North Manchester, Ind.

TITLE CONTEST AWARDS



NOVEMBER COVER

RULES
JANUARY CONTEST

Ten cash prizes will be awarded for the 10 best titles for the picture on the front cover.

The first prize will be $20 cash and nine second prizes of $2 in cash will be awarded.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

Titles need not be longer than 10 words —the shorter the better—and they do not have to rhyme.

All members of the farm family to whom this magazine was sent may submit titles, but each contestant may submit only one title.

Question "A" must be answered correctly.

Send your title on the coupon below or make out a similar form on a plain sheet of paper or government post card.

Entries must be sent to the Title Editor, ELECTRICITY ON THE FARM, 6 North Michigan Avenue, Chicago, Illinois, before February 1st.

Winning names and titles will be announced in the March issue.

Winners for November

First Prize—$20

"Turkey Day
The electric way,
Set your clock
And go away."

CLARA PETERSEN,
R. F. D. 2, Council Bluffs, Iowa.

Nine $2.00 Cash Prizes

"Visions of Thanksgiving, a twofold treat;
Just set the clock and turn on the heat."
LEWIS V. LANHAM, R.F.D. 6, Box 205, Richmond, Va.

"The pride of the flock, roasted to the tune of the electric clock."
MRS. IRVING J. MANSHOEM,
R.F.D. 1, Grand Rapids, Mich.

"When electricity roasts the 'winner,'
Mother can truly enjoy the dinner."
BEATRICE R. SLADE, Box 108, Hubbardston, Mass.

"Farmer in flock—turkeys suspicious,
Electricity in stove—turkeys delicious."
F. L. SEARS, Delta, Colo.

"Choice of the flock
Cooked electrically—watched by the clock."
MRS. CHAS. T. SMITH, Jr., R.F.D. 1, Amherst, Va.

"Feeding the flock,
Roasting one electrically 'by the clock'."
W. S. PALMER, Chester, Mass.

"Turkey for Thanksgiving Day
Timed and cooked electric way."
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For one of these birds electrically cooked."
FRANK L. BRENNER, Doniphan, Kans.

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